



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,474	08/29/2001	Yasuo Shinohara	Q65911	4884

7590 09/02/2005

SUGHRUE, MION, ZINN,  
MACPEAK & SEAS, PLLC  
2100 Pennsylvania Avenue, N.W.  
Washington, DC 20037-3213

EXAMINER
----------

WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
----------	--------------

1746

DATE MAILED: 09/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/940,474

Applicant(s)

SHINOHARA ET AL.

Examiner

Monique M. Wills

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Request for Continued Examination*

The request filed on ~~December 30, 2004~~ <sup>July 8, 2005</sup> for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 09/940,474 is acceptable and a RCE has been established. An action on the RCE follows.

### *Response to Arguments*

This Office Action is responsive to the Amendment filed July 8, 2005. Claims 1-2 & 4-11 stand rejected under 35 U.S.C. 102(e) as being anticipated by Shinohara et al., U.S. Patent 6,447,958. Newly added claim 12 is also rejected under 35 U.S.C. 102(e) as being anticipated by Shinohara et al., U.S. Patent 6,447,958 A brief reiteration is recited below.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2 & 4-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Shinohara et al., U.S. Patent 6,447,958.

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Shinohara teaches a non-aqueous electrolyte battery separator comprising a heat-resistant nitrogen-containing aromatic polymer and a ceramic powder (abstract). With respect to claim 1, Shinohara teaches a separator comprising: a thermoplastic polymer fiber substrate, embracing the instant shut-down layer (col. 5, lines 40-55); a microporous heat-resistant nitrogen-containing aromatic polymer (col. 2, lines 45-55) with a porosity of less than 1Tm (col. 10, lines 40-50); and a thermoplastic spacer formed from a fine particle-like suspension (col. 10, lines 1-10). The particle coating, at column 10, lines 1-10, embraces Applicant's spacer, because it separates the surface of the heat-resistant layer from an adjacent electrode. See column 10, lines 1-5, and column 13, lines 18-23. With respect to claim 2, the heat resistant layer consists of a para-aramid porous resin (col. 4, lines 23-28). With respect to claim 5, the spacer is formed of particles with a diameter of 1 $\mu$ m (col. 14, lines 45-53). With respect to claims 7 & 8, the spacer is formed by coating a liquid suspension on the surface of a heat-resistant microporous layer (col. 14, lines 44-53). With respect to claim 9, the spacer consists of an electrochemically stable polyolefin (col. 14, lines 43-53). With respect to claim 10, the separator is employed in a non-aqueous electrolyte secondary battery (col. 1, lines 5-10). With respect to claim 11, the spacer is adjacent the cathode, because the spacer forms the top layer of the separator (col. 14, lines 45-53) and the battery is

Art Unit: 1746

laminated in the order of cathode, separator and anode (col. 13, lines 15-25).

With respect to claim 12, the thermoplastic shut-down layer (col. 9, lines 37-41) is coated with a heat-resistant microporous layer (col. 9, lines 40-45), the dried coating is then reinforced with a fine particle like suspension, embracing the instant spacer. See col. 10, lines 1-10.

Therefore, the instant claims are anticipated by the prior art set forth. The limitation in claim 1, with respect to separator comprising a shut-down layer, is considered to be an inherent property of substrate as set forth in the prior art, because Shinohara teaches a substrate made of thermoplastic polyolefins and polyesters (col. 5, lines 40-50), which have melting temperatures suitable for shut-down (col. 6, lines 15-20). The employment of a polyester substrate is exemplified at column 14, lines 15-20. The limitation in claim 1, with respect to the heat-resistant layer being microporous, is considered to be an inherent property of the separator as set forth in the prior art, because the separator of Shinohara has void spaces of less than 1  $\mu\text{m}$  (col. 10, lines 25-50). The limitation in claim 1, with respect to the heat-resistant layer having a temperature of deflection under load of 18.6  $\text{kg/cm}^2$  at 100°C, is considered to be an inherent property of the para-aramid porous resin as set forth in the prior art, because Shinohara employs the same heat-resistant resin material set forth by Applicant. Applicant's specification at page 6, lines 12-

Art Unit: 1746

15, discloses that aramide polymers have a temperature of deflection under load of 18.6 kg/cm<sup>2</sup> at 100°C or more. The limitation in claims 4 & 6, with respect to the spacer being an electrochemically stable polymer (claim 4), wherein the static friction coefficient between the spacer-disposed separator surface and a stainless steel surface ground by a 1000 grit polishing paper is 0.5 or less, is considered to be an inherent property of the spacer as set forth in the prior art, because Shinohara employs the same polyolefin spacer material set forth by Applicant.

### *Response to Arguments*

Applicant's arguments, with respect to Shinohara not teaching a spacer are unpersuasive. Specifically, Applicant contends that the particle coating functions as a shut-down layer instead of a spacer. In other words, it is argued that Shinohara does not teach a shut-down layer that is separate from the spacer. This argument is not persuasive. Although the shutdown layer and the particle suspension are both thermoplastic polymers, they are separate and distinct structures. The particle layer set forth in column 10, lines 1-10 of Shinohara, is a suspension used to reinforce the shut-down layer. The shut-down layer is a thermopolymer made of woven fabric, non-woven fabric, paper or porous film (col. 9, lines 39-41). The shut-down layer is coated with a heat

Art Unit: 1746

resistant layer (col. 9, lines 40-45) and an *additional* thermoplastic particle-like suspension. The suspension is used to reinforce the shut-down properties of the separator. Although the particle-like suspension may be considered an additional shut-down layer, it embraces the instant spacer because it provides distances between the heat-resistant layer and adjacent electrodes. Therefore, the particle suspension has a dual function as both a shut-down layer and a spacer. Consequently, the resulting structure includes a shut-down substrate, a heat-resistant layer *and* a shut-down/spacer suspension.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Michael Barr, may be reached at 571-272-1414. The fax



Art Unit: 1746

phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MW

8/29/05

**MICHAEL BARR**  
**SUPERVISORY PATENT EXAMINER**

A handwritten signature in black ink, appearing to read "Michael Barr", with a stylized flourish at the end.

Application/Control Number: 09/940,474

Page 9

Art Unit: 1746